

*THE EFFECTS OF NIGHTTIME SEAT BELT ENFORCEMENT ON  
SEAT BELT USE BY TAVERN PATRONS:  
A PRELIMINARY ANALYSIS*

J. E. LOUIS MALENFANT

UNIVERSITÉ DE MONCTON

AND

RON VAN HOUTEN

MOUNT SAINT VINCENT UNIVERSITY

The purpose of this study was to determine the effects of police enforcement and the use of signs and posters in promoting seat belt use by nighttime tavern patrons. Ten taverns in two cities served as sites. Data were collected on the nighttime seat belt use of tavern patrons and daytime citywide seat belt use. Results indicated that the intervention increased nighttime seat belt use by tavern patrons. Daytime seat belt use increased in one city and remained at a high level in the other following the intervention. Because previous research has shown that tavern patrons are overrepresented in the impaired driving population, and that seat belt use decreases the likelihood of serious injury or death, results of this study suggest that enforcement of seat belt use could reduce casualties resulting from impaired driving.

DESCRIPTORS: safety belts, alcohol-impaired driving, police, driving behavior

Traffic accidents are the major cause of death among Canadians under 40 years of age; in 45.7% of these fatalities in seven Canadian provinces drivers had blood alcohol concentrations (BAC) over 80 mg% in 1984 (Transport Canada, 1986). Governments have responded by legislating stringent penalties for impaired driving and equally stringent penalties for refusing to submit to a test of blood alcohol concentration.

One of the largest reductions in casualties associated with such legislation occurred in Britain following the introduction of the British Road Safety Act of 1967 (Ross, Campbell, & Glass, 1970). Ross et al. (1970) reported an initial 45% reduction in accidents during peak drinking periods (weekend nights). At the end of 1 year the reduction had declined to 30%. Furthermore, the effect of the legislation continued to decline over the next several

years until the effect could no longer be detected (Codling, 1975). When similar legislation was passed in Canada, the effects were briefer than those produced in Britain (Carr, Goldberg, & Farber, 1975).

One approach often used to increase the effectiveness of legislation is the use of saturation enforcement programs such as the R.I.D.E. program in Etobicoke, a borough in metropolitan Toronto (Vingilis, Chung, & Adlar, 1981; Vingilis & Salutin, 1980). The R.I.D.E. program involved officers randomly stopping motorists to check for valid drivers' licenses and occasionally proof of insurance or registration. If there was any sign of drinking, a breath testing device was used. If the individual failed the screening test he or she was taken to police headquarters for a breathalyzer test. This procedure took only a few minutes to complete unless the motorist was required to provide a breath sample and charged with impaired driving. Over the course of this study slightly under 1% of those stopped were tested.

The introduction of the R.I.D.E. program was not associated with a significant reduction in alcohol-related accidents or injuries, although there

---

This research was supported by Contract 052 85 000 66 from Transport Canada.

Reprints may be obtained from Louis Malenfant, Vice President, Université de Moncton, Moncton, New Brunswick E1A 3E9, Canada; or Ron Van Houten, Psychology Department, Mount Saint Vincent University, Halifax, Nova Scotia B3M 2J6, Canada.

were nonsignificant reductions in these measures. One possible reason for the failure to obtain a significant effect may involve the inefficiency of the random spot check approach used to identify impaired drivers.

The results of an experiment carried out by Van Houten, Nau, and Jonah (1985) demonstrated that often more than 50% of drivers leaving drinking establishments on Thursday and Friday nights were legally impaired. In contrast, roadside survey data collected on drivers stopped randomly on Thursday, Friday, and Saturday nights indicated that between 2.6% and 13.4% of drivers were legally impaired (Hieatt and Associates, 1981; Smith, Wolynetz, & Wiggins, 1976). Comparison of these results suggests that drivers leaving drinking establishments comprise a disproportionately large percentage of the drinking and driving population, and hence should be important targets for drinking and driving countermeasures.

Results of this experiment also showed that the addition of a brief enforcement campaign to the feedback program produced a reduction in drivers' BACs that persisted for a very brief period. It is interesting to note that when the police randomly chose which vehicles were to be stopped, very few drinking drivers were detected, even though checkpoints were set up at optimal times and locations. In contrast, when police were able to stop drivers selectively, over two and one half times more drivers were charged or warned. Although this demonstrates that the efficiency of enforcement can be dramatically improved, it is questionable whether this approach would be legally or politically acceptable in North America.

Another possible method of identifying impaired drivers before pulling them over is to determine whether they are wearing a seat belt. Research findings provide evidence that suggests drivers who wear seat belts tend to be safer drivers. For example, belted drivers take fewer risks than unbelted drivers (Ashton, Mackay, & Camm, 1983; Deutsch, Sameth, & Akinymemi, 1980; Evans & Wasielewski, 1982), and belted drivers have lower accident rates than unbelted drivers (Evans & Wasielewski, 1983). The lower than expected benefits of mandatory seat

belt laws have also been explained in terms of selective recruitment from safer than average drivers (Evans, in press). Data collected from a roadside survey in Ontario (The 1979 Ontario Roadside Survey Summary Report, 1980) indicated an inverse relationship between belt use and impaired driving. The relationship between driver impairment and seat belt use is particularly unfortunate because more lives could be saved by seat belt legislation if more drivers involved in alcohol-related crashes wore their seat belts.

Because of this relationship, we hypothesized that selectively pulling over people not wearing belts in the vicinity of drinking establishments should lead to increased seat belt use by members of this high-risk group. Therefore, the purpose of this research was to examine the effects of a 24-hr seat belt enforcement operation that included prompting belt use by drinking establishment patrons.

## METHOD

### *Subjects and Setting*

Subjects in this experiment were patrons of six drinking establishments in Halifax and four drinking establishments in Moncton. Data were collected on Thursday and Friday nights between 10:00 p.m. and 2:00 a.m. The following criteria were used to select taverns: First, the tavern had to have on premises parking facilities to allow observers to record seat belt use; second, the parking lot had to be reasonably well lighted with a clear view of the main exit; third, the tavern had to have sufficient patrons to warrant observation; fourth, the owner had to be willing to give permission to post signs. Although it was possible to find six taverns that met all the above criteria in Halifax, it was possible to find only four taverns in Moncton that met all of these criteria.

### *Measures*

*Belt use by drivers leaving drinking establishments.* Seat belt use was determined by observing whether each driver was wearing his or her shoulder belt. Because of the harsh winters and salt

in the air and on the roads, vehicles have a short life span in Atlantic Canada and therefore less than 1% of vehicles in Halifax and Moncton are unequipped with shoulder restraints. The seat belt use of drivers leaving drinking establishments was measured by observers seated in parked cars near the parking lot exit or across the street from the parking lot exit. The observers recorded the time of departure and whether each driver was wearing a seat belt. Two drinking establishments were randomly sampled without replacement in Halifax on Thursday night and two drinking establishments were randomly selected without replacement on Friday night. Because of staffing problems, data were collected on Saturday rather than Thursday night in one instance (the penultimate baseline session); in another instance an error in communications resulted in the collection of additional data on one Saturday night (last session of the postenforcement condition). In both cases the data collected on Saturday night did not differ more than a few percentage points from the data collected on the preceding Thursday.

In Moncton, seat belt parking lot data were usually collected on Thursday and Friday nights. Each of the four taverns was sampled each week except on three occasions when staffing problems prohibited it. On those occasions tavern selection was determined by a random draw. The data were then averaged to obtain a weekly data point. On one third of the nights a second observer seated in a second car parked adjacent to that of the primary observer independently recorded departure times and whether the driver was wearing his or her seat belt. Interobserver agreement was calculated on the occurrence of seat belt use by dividing the number of agreements on the occurrences of seat belt use by the number of agreements on the occurrences of seat belt use plus the number of disagreements on seat belt use. Interobserver agreement on driver seat belt use averaged 96% in Halifax and 95% in Moncton (range, 89% to 100%).

#### *Daytime Seat Belt Surveys*

Daytime seat belt surveys were obtained to determine whether the enforcement programs pro-

duced increases in seat belt use similar to those obtained in other seat belt enforcement programs. Three daytime seat belt surveys were conducted in each city on weekdays between 10:00 a.m. and 4:00 p.m. Two independent observers recorded whether 200 drivers were wearing their seat belts on eight busy streets in each city. The observers sampled 100 drivers traveling in one direction on each street and 100 drivers traveling in the opposite direction. In all, the seat belt use of 1,600 drivers was sampled during each survey in each city. The first survey was obtained in the middle of the baseline condition, the second survey was obtained 2 weeks after the start of the enforcement campaign, and the third survey was obtained 1 month after the termination of the seat belt campaign. In addition, one nighttime survey was carried out in Halifax during the baseline condition. Interobserver agreement averaged 98% in Halifax and Moncton.

#### *Experimental Design*

After baseline data had been collected on the percentage of drivers wearing seat belts leaving each of the targeted drinking establishments in each city, an enforcement campaign was introduced in Halifax. Subsequently the enforcement campaign was also introduced in Moncton.

*Baseline.* During the baseline condition there was no systematic enforcement of seat belt use in either city.

*Enforcement condition.* During this condition the seat belt enforcement operation was implemented. The beginning of this operation was accompanied by a press release and the erection of 20 signs throughout the city that warned of day and night seat belt enforcement (see Figure 1). In addition, posters resembling the signs were posted at the exits of all drinking establishments within the city as well as several shopping malls. This was done because the results of prior research have shown that one way to increase the effectiveness of an enforcement program is to prompt the desired behavior (Malenfant, Van Houten, Hall, & Cahoon, 1985; Van Houten, Malenfant, & Rolider, 1985).

The enforcement operation was carried out for four weekends in each city. This operation was



Figure 1. The sign used to warn drivers that seat belt use was enforced around the clock. A similar bilingual (French and English) sign was used in Moncton.

advertised as a 24-hr seat belt enforcement program. All members of the police department on patrol were instructed to enforce seat belt use whenever they were not busy with other work. In addition, nighttime enforcement was carried out by one team of two officers with one marked car at checkpoints in well-lighted areas. During each night of enforcement, the police set up the checkpoints at predetermined locations on city streets with the lights of the police cruiser flashing. Six checkpoints were used in each city. All were situated on busy streets to maximize exposure to the program. No checkpoint was situated in close proximity to a drinking establishment. The checkpoints were set up only on Thursday and Friday nights from 9:00 p.m. to 2:00 a.m., to ensure some seat belt enforcement at these times. Police stayed at each location for 1 hr and then moved on to the next site, covering from three to four sites per night. Police stopped vehicles passing the checkpoint only if the driver was not wearing a seat belt. These drivers

were given a verbal warning, a written warning ticket, or a traffic citation for failing to wear their seat belt. In Halifax police charged 104 motorists with failing to wear their seat belts and gave written warnings to 182 motorists and verbal warnings to 782 motorists, for a total of 1,048 warnings and charges. In Moncton police gave verbal warnings to 2,482 motorists.

*Postenforcement condition.* During this condition the 20 signs warning of enforcement and the posters in drinking establishments continued to be displayed. The enforcement program was discontinued.

## RESULTS

### *Daytime Seat Belt Survey*

Results of the three daytime seat belt surveys in Halifax indicated a constant level of seat belt use (86%) during all three surveys. This figure compared favorably with the provincial average of 81% obtained by Transport Canada. In Moncton, the percentage of drivers wearing seat belts was 62.5% during the baseline condition, 73% during the enforcement condition, and 66% during the postenforcement survey. Results of the one nighttime survey carried out in Halifax indicated that 83.4% of the sample were wearing their seat belts during the baseline condition.

### *Belt Use by Drivers Leaving Drinking Establishments*

The mean percentage of seat belt use by drivers leaving drinking establishments in both cities each weekend is presented in Figure 2. During the baseline condition the percentage of drivers wearing their seat belts averaged 54% in Halifax and 58% in Moncton. Following the introduction of the enforcement program the percentage of drivers wearing seat belts increased to 63% in Halifax and 74% in Moncton. During the postenforcement period the percentage of drivers wearing seat belts remained about the same at 62% in Halifax and 66% in Moncton.

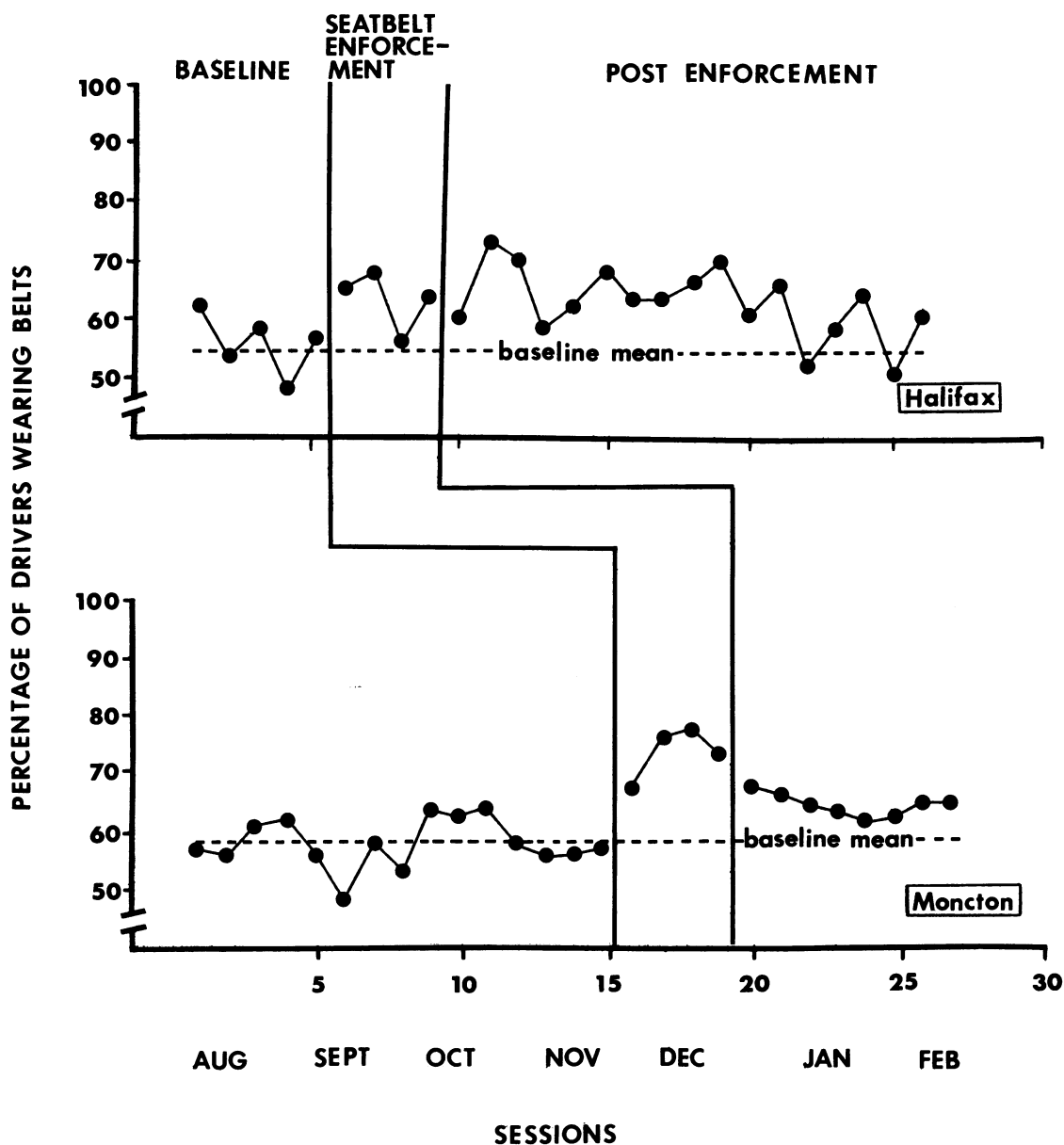


Figure 2. The percentage of drivers leaving drinking establishments who were wearing their seat belts during each weekend of the experiment in Halifax and Moncton. The dashed horizontal lines represent the mean level during the baseline condition.

## DISCUSSION

This study demonstrated that the percentage of drinking establishment patrons wearing seat belts increased slightly during a brief enforcement condition that included prompting signs, police enforcement, and limited publicity. This finding may

be significant because previous research has indicated that drinking establishment patrons are a high-risk group for driving under the influence of alcohol (Calvert-Boyanowsky & Boyanowsky, 1977; Van Houten, Nau, & Jonah, 1985). It is interesting to note that the percentage of seat belt use among drinking establishment patrons was considerably

lower than among the general population in Halifax where seat belt use was high but not much different from the general figure in Moncton where seat belt use was low. It should also be noted that the results of the nighttime seat belt survey in Halifax yielded a figure that was only marginally lower than the daytime survey, whereas the tavern seat belt data were markedly lower.

Researchers have speculated that seat belt laws may not save the predicted number of lives despite high compliance levels because the higher risk drivers (i.e., those that disobey the law and have more accidents) are those least likely to wear their seat belts (Ashton et al., 1983; Deutsch et al., 1980; Evans & Wasieleski, 1982, 1983). Hence, targeting this group of drivers (drinking drivers) to buckle up may be one effective way of improving the effectiveness of seat belt laws. One reason that impaired drivers may be particularly sensitive to seat belt enforcement is that they risk detection of their impaired state because of noncompliance with seat belt laws. Programs that influence drinking drivers to use their seat belts have great potential for saving lives, because this group is much more likely to become involved in serious single- and multiple-vehicle crashes. Future research should investigate whether greater effects can be produced by increasing the amount and intensity of enforcement.

## REFERENCES

- Ashton, S. J., Mackay, G. M., & Camm, S. (1983). Seat belt use in Britain under voluntary and mandatory conditions. *Proceedings of the 27th Annual Conference of the American Association for Automotive Medicine* (pp. 65-75).
- Calvert-Boyanowsky, J. & Boyanowsky, E. O. (1977). *Tavern breath testing as an alcohol countermeasure: A research report to the Ministry of Transport CR 7903*. Ottawa, Ontario, Canada: Transport Canada.
- Carr, B. R., Goldberg, H., & Farber, C. M. L. (1975). The Canadian breathalyzer legislation: An inferential evaluation. In A. Birrell (Ed.), *Alcohol, drugs and traffic safety* (pp. 679-687). Toronto, Ontario, Canada: Addiction Research Foundation.
- Codling, P. J. (1975). *Road casualties since the drinking and driving legislation*. Transport and Road Research Laboratory Supplementary Report 134 UC, London.
- Deutsch, D., Sameth, S., & Akinyemi, J. (1980). Seat belt usage and risk-taking behavior at two major traffic intersections. *Proceedings of the American Association for Automotive Medicine*.
- Evans, L. (in press). Human behavior feedback and traffic safety. *Human Factors*.
- Evans, L., & Wasieleski, P. (1982). Do accident involved drivers exhibit riskier everyday driving behavior? *Accident Analysis and Prevention*, **14**, 57-64.
- Evans, L., & Wasieleski, P. (1983). Risky driving related to driver and vehicle characteristics. *Accident Analysis and Prevention*, **15**, 121-136.
- Hieatt and Associates, Inc. (1981). Night time driver surveys: Organizational and operational experience from Ontario (1979), British Columbia (1981), and Saskatchewan (1981). Ottawa, Ontario, Canada: Ottawa's Road and Motor Vehicle Traffic Safety Branch, Transport Canada.
- Malenfant, L., Van Houten, R., Hall, R. V., & Cahoon, G. (1985). The use of posting, prompting, and police enforcement procedures to increase driver yielding and pedestrian signaling at marked crosswalks. *Journal of Police Science and Administration*, **13**, 295-302.
- The 1979 Ontario Roadside Survey Summary Report. (1980). Interministerial Committee on Drinking-Driving, Ottawa, Ontario, Canada.
- Ross, L. H., Campbell, D. T., & Glass, G. V. (1970). The British "breathalyzer" crackdown of 1967. *American Behavioral Scientist*, **13**, 495-509.
- Smith, G. A., Wolynetz, M. S., & Wiggins, T. R. I. (1976). 1974 National roadside survey: BAC of night time Canadian drivers. TP 13111. Ottawa, Ontario, Canada: Transport Canada.
- Transport Canada. (1986). Alcohol use by drivers fatally injured in motor vehicle accidents: Focus on 1983-1984. Transport Canada road safety leaflet no. 8604(E). Ottawa, Ontario, Canada: Road Safety Directorate, Transport Canada.
- Van Houten, R., Malenfant, L., & Rolider, A. (1985). Increasing driver yielding and pedestrian signaling with prompting, feedback, and enforcement. *Journal of Applied Behavior Analysis*, **18**, 103-110.
- Van Houten, R., Nau, P. A., & Jonah, B. (1985). Effects of feedback on impaired driving. In S. Kaye & G. W. Meier (Eds.), *Alcohol, drugs and traffic safety* (pp. 1375-1394). Washington, DC: U.S. Government Printing Office.
- Vingilis, E., Chung, L., & Adlar, E. (1981). *R.I.D.E. (Reduce Impaired Driving in Etobicoke), a driving-while-impaired countermeasure programme: A final eighteen month evaluation*. Toronto: Addiction Research Foundation.
- Vingilis, E., & Salutin, L. (1980). A prevention programme for drinking and driving. *Accident Analysis and Prevention*, **12**, 267-274.

Received January 22, 1987

Initial editorial decision May 9, 1987

Revisions received July 20, 1987; September 14, 1987

Final acceptance October 26, 1987

Action Editor, Brandon F. Greene